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CASE STUDY

Manheim Interactive: Selling Cars Online

Richard Woodham and
Peter Weill

February 2001

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CISR Working Paper No. 314

Title: **Manheim Interactive Selling Cars Online**

Author: **Richard Woodham and Peter Weill**

Date: **February 2001**

Abstract: Manheim Interactive is a subsidiary of Manheim Auctions, a 55-year old brick-and-mortar firm that is the number one player in offline vehicle remarketing. Since 1996, Manheim has been remarketing used automobiles over the Internet. Manheim Interactive has found that the strength of the Manheim Auctions brand and the confidence and trust that independent car dealers have in Manheim Auctions has been pivotal in increasing the number of cars sold online from 62 to in 1996 to 100,000 cars with a value of $1.5 billion in 2000. The case study describes the online services offered, the approach to managing the online business, the relationship with the physical auctions business, the IT Infrastructure & applications that deliver the online services, and the metrics used to measure the success of Manheim Interactive.

Pages 10

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Massachusetts Institute of Technology
Sloan School of Management

Center for Information Systems Research

Working Paper #314

MANHEIM INTERACTIVE:
Selling Cars Online

Hal Logan, CEO of Manheim Interactive logged onto Manheim Online[1] and watched the 100,000th car sell online. He reflected on the growth of the online service since 1996. In 1996, 62 vehicles sold online and one consignor,[2] Lexus Financial Services, had listed its vehicles. At the beginning of 2001, 100,000 cars had been sold online with a value of $1.5 billion and 50 different consignors listed their vehicles on Manheim Online.

Hal Logan realized that despite this impressive growth there were still challenges to overcome and critical decisions to be made for Manheim Interactive to fully leverage its online initiatives. Manheim Interactive is a subsidiary of Manheim Auctions, a 55-year old brick-and-mortar that is the number one player in offline vehicle remarketing. A key challenge for Manheim Interactive is to convince dealers, traditionally used to seeing and touching a vehicle before purchase at the auction site, that the online vehicle purchasing process can provide an equal level of trust and comfort. Hal Logan reflected on this issue of trust:

> *I think that one of the real keys to our being able to make that transition happen is the fact that we have a name that dealers trust and rely on. It's a huge leap of faith to look at a car on a screen and not be able to touch the side to see if it's been repainted. Not be able to kick the tires, literally. Not be able to stick your head in and smell the interior to see whether it smells like cigar smoke, or something. But to make that purchase and again, to be putting tens of thousands of dollars on the line, in some cases, behind those units of inventory.*

Logan pondered how, as increasing numbers of dealers subscribed to the service, Manheim Interactive would become a profitable business satisfying the needs of multiple stakeholders including employees, car dealers, consignors, and the parent, Manheim Auctions.

The Car Auction Business

Founded in 1945, Manheim Auctions is a wholly owned subsidiary of Cox Enterprises, a privately owned Atlanta based corporation. Cox Enterprises has four other divisions: Cox Newspapers, Cox

[1] Manheim Online is the Internet based service offered to dealers and consignors for remarketing used automobiles.

[2] A consignor is a manufacturer like GM or a fleet manager such as Avis, or a bank who leases cars. The consignor's vehicles have a finite life and at the end of the life, Manheim Auctions remarkets them to car dealers.

This case was prepared by researcher Richard Woodham and Dr. Peter Weill of the Center for Information Systems Research at the MIT Sloan School of Management. This case is for the purposes of class discussion, rather than to illustrate either effective or ineffective handling of a managerial situation. The case is part of a research project on e-business migration conducted jointly by Melbourne Business School and the MIT Sloan School. Support for the project from PricewaterhouseCoopers LLC is gratefully acknowledged.

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Communications, Cox Broadcasting, and Cox Interactive Media.[3]

Manheim Auctions is the largest automobile auction company in the world with more than 25,000 employees located at 86 physical auction sites in North America, 20 sites in the UK, and 10 sites in Australia and New Zealand. In 1990, Manheim had fewer than 30 auction sites; growing to over 110 sites worldwide via a series of acquisitions of competitors, including the auto auction businesses of Ford Motor Credit and GE Capital in 1991[4] and ADT Automotive in January 2000.[5] In 2000, about seven million automobiles passed through Manheim auction sites and four million of these sold with a gross value of $39 billion generating revenues of approximately $1 billion for Manheim Auctions.

In the last 50 years, Manheim Auctions has developed a successful wholesale auction business, setting the standard for customer service in a very competitive industry. Hal Logan reflected on Manheim's principal customers:

> *If you stop and think about it, there are not a lot of places that a used car dealer can go and be treated as an honored and valued customer. That may or may not be an accurate reflection of the way used car dealers behave, but we love them. And we go way out of our way to make sure we give them absolute white glove treatment at the auctions. We have, for 55 years, had the position of being a neutral intermediary between the sellers of used vehicles and the buyers of used vehicles. And in order to build and maintain that position, we have had to be very honest, very trustworthy, and very reliable. A place where a dealer knows that if something goes wrong, if they buy a car and it is not what it was represented to be, we will do everything under the sun to arbitrate that issue with the seller.*

Manheim Auctions facilitates the remarketing of used automobiles by providing a marketplace where consignors—typically manufacturers, banks, fleet managers, lease companies, and rental-car companies—can sell their used-car inventories to wholesale dealers. Manheim Auctions collects, reconditions, and documents the consignor's inventories before offering the cars via auctions to car dealers. Hal Logan described the scene at a Manheim physical auction:

> *In the offline world, car dealers have used auctions for years, standing in the lanes, watching these cars roll down the lane. The doors open at 9:00 o'clock in the morning. A typical auction facility has anywhere between ten and fifteen physical lanes. Adjacent to each lane is a podium. On the top of that podium stands an auctioneer and he begins chanting about each of the cars coming down the lane. The cars stream down the lane and every 45 seconds or so the hammer falls—the car either sells or it doesn't, and it goes out the other end closely followed by another car.*

After the dealer has purchased a car, Manheim Auctions provides all the back-office services to transfer the ownership of the vehicle, collect the funds and transport the vehicle to the dealer's lot.

Industry Background

The ADT Automotive Used Car Report[6] stated that the 1999 used car market was the strongest since 1995 despite record sales of new vehicles. ADT reported simultaneous strength in the new and used vehicle markets in 1999 with a combined market value of more than $700 billion.

New vehicle sales were 16.9 million units, demolishing the 1986 record of 16.1 million. Total volume for used vehicle sales reached 40.9 million units with a value of $361 billion (the second best volume ever behind 1995, when 41.8 million used vehicles were sold). The used car market is expected to continue to grow in the coming five years.

[3] Hoovers Online: Cox Enterprises Company Profile
[4] Ibid
[5] Bizjournals.com 01/14/00 – Manheim Auctions buys ADT Automotive for $1B

[6] ADT 2000 Used Car Market Report (released in February 2000) relies on statistical data composed of proprietary research as well as data from The Polk Company, Goldman, Sachs & Co., Bobit Publishing, the National Automobile Dealers Association, CNW Marketing/Research, J.D. Power and Associates, the National Auto Auction Association, and others.

Year[7]	Vehicles in Operation	Used Vehicle Sales
1990	175,352	37,530
1992	181,074	36,950
1994	188,717	40,141
1996	198,294	40,865
1998	206,370	41,274
2000	209,869	41,134
2002	216,818	41,629

Figure 1—Vehicles in Operation versus Used Vehicle Sales

The ADT report notes that leasing hit a high of 4.1 million units in 1999, and predicts that this volume will stabilize over the next four years to levels between 3.5 and 3.9 million units. As these vehicles come off lease, approximately 1.9 million vehicles will be remarketed annually through auctions. Internet-based new and used vehicles sales in 1999 were more than 1.5 million units—up six percent from 1998. Of those vehicles, 1,054,000 were new and 457,000 were used.

Consumer research demonstrated that vehicle certification[8] by remarketing entities significantly increases the trust consumers have in the purchased vehicle and the likelihood that the consumer would purchase another used vehicle. This development represents a significant opportunity for Manheim Auctions because vehicles certified by Manheim Auctions will be easier for dealers to sell.

Manheim Interactive

In February 2000, Manheim Auctions announced the launch of Manheim Interactive, a separate wholly owned B2B electronic commerce company that answered the demand from dealers, manufacturers, and other used car remarketers for new, innovative, technology-based tools to more effectively manage the used car remarketing process. Manheim Interactive has two separate business units. Hal Logan described these services:

> *There is a unit here in Atlanta called Manheim Online which is an Internet company that applies Internet technology to the remarketing process in a number of different ways. Then there is a second unit down in Orlando, Florida called Manheim Dealer Support Services (MDSS). MDSS is a PC software company. It has built a piece of software called Tracker, which independent used car dealers use for the basic blocking and tackling needed to run their businesses. It does inventory control, accounting and calculates the contract between the dealer and the retail customer. It prints out all of those forms that you need to sign every time you buy a car. It is the dealership management system software that the used car dealer not affiliated with a new car franchise uses.*

At the end of 2000, Manheim Interactive had revenues of $16 million and 275 employees with 150 employees focused on Manheim Online and 125 employees working in Orlando on MDSS. Both service offerings are based on a combination of subscription and transactional revenue streams. Manheim Online is a subscription service sold to dealers with a $50 monthly subscription for a range of bundled services. The Tracker product from MDSS is sold to independent used car dealers who are offered a range of additional services for a transaction fee.

Manheim Interactive was established to extend and compliment the franchise of Manheim Auctions. Manheim Interactive improves the service that Manheim Auctions offers to both consignors and dealers. Donald Foy, VP of Marketing and Product Planning of Manheim Interactive explained the process:

> *The online application enhances the experience of a dealer who comes to our physical locations to buy and sell cars. We want to make it a better experience to deal with Manheim. Cyber Lots, where cars are bought and sold on line are a complimentary service. Typically, what happens is that a consignor will send a car to us. It enters the auction gate. And then it's parked on the auction lot for a period of time before it actually runs down the lane. That can be a matter of days in some cases, but it can be a matter of weeks in some cases. If it's a manufacturer and they already have 400 of a particular make, model and color of car sitting there, it may be a while before the next one that arrives has a chance to run down the lane. From that manufacturer's point of view, that's a*

[7] ADT Automotive Inc. (1998 Used car market Report)

[8] Certification is the process where the remarketing entity (Manheim Auctions) inspects and provides a warranty for the vehicle.

$15,000 piece of inventory that is depreciating every day it sits there. So if we can put that car up on the Web site and make it available for a dealer to buy prior to the time it would have had a chance to run done the lane, then there is a tangible savings of holding costs and depreciation costs for that seller of the vehicle.

Online Services

Manheim Online is an Internet-based service facilitating the remarketing of automobiles on the Internet and is only available to licensed automobile dealers. Hal Logan explained the philosophy of Manheim Online:

> *When a dealer subscribes to Manheim Online, he or she receives a bundle of services. This is a portal for dealers that we hope, over time, will become the starting place for dealers who are going onto the Internet for anything from information about cars, to information about golf, to information about the car business.*

The Manheim Online service consists of two sets of tools: the CyberSuite and MyManheim. CyberSuite offers transactional tools that facilitate buying and selling vehicles online.

MyManheim delivers three types of content. Information is provided about Manheim physical auctions. Information specific to the U.S. used car market is available via the Manheim Market Report (MMR). And, finally information generally available on the Internet (e.g. weather reports, stock quotes, and news) is also available from MyManheim—on a personalized page. A search capability called PowerSearch provides a standardized way to find specific vehicles that meet dealer requirements. The structure of the service offering is shown in Figure 2.

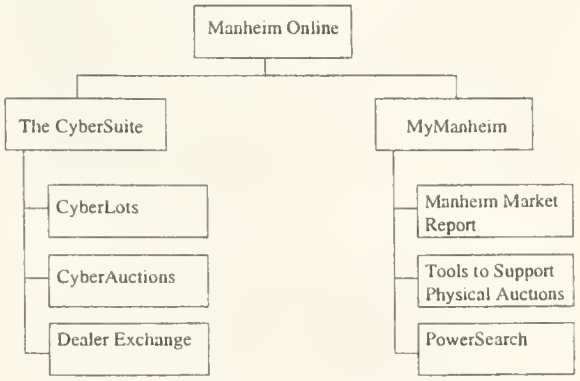


Figure 2—Manheim Online Service Offering

CyberLots: CyberLots are the forum for purchasing vehicles online at a fixed price. When a vehicle has been inspected and registered at the physical auction site, the vehicle becomes available for sale on the CyberLot. The consignor of the vehicle then sets the price of the vehicle and the vehicle becomes available to be purchased at a fixed price on a 24/7 basis. The consignors continuously update the CyberLot with new cars. (See Exhibit 1.)

CyberAuctions: Once a vehicle has been registered with the physical auction site, the consignor sets start bid price, floor price and incremental price changes. Bidding occurs dynamically over the two hours that the online auction is in progress and the winner of the auction is the highest bidder.

Dealer Exchange: Dealer exchange allows dealers to trade vehicles with other dealers who are Manheim Interactive subscribers. Dealers list their vehicle inventories on their personal CyberLots. Dealers search for vehicles from the Dealer Exchange search screen and if the search generates an interest, the vehicle is bought using an identical process as a vehicle identified and purchased with PowerSearch.

Manheim Market Report (MMR): The MMR is a report providing customers with wholesale pricing information on all vehicles sold by Manheim Auctions through all distribution channels. The dealer can enter details of the make, model and selling region for a particular make of vehicle and find retail and wholesale prices for the vehicle. Hal Logan explained the value of MMR:

> *The MMR is actually one of the most highly valued elements of the subscription package. There are many dealers who subscribe to our service who are simply not yet ready to buy cars online. And yet they continue to pay the $50 a month because they can go online, look at the market report, and get absolutely accurate data about vehicle values in real time.*

Physical Auction Support Tools: These tools provide information on all aspects of the Manheim Physical Auctions. Traditionally, the dealer had to telephone the auction to find out about both general information such as auction schedules, location, upcoming physical auction inventory, transportation services, funds transfer policies and more specific information such as the dealer's account balance. All

this content is now available to the dealer from his/her personal page on MyManheim.com.

PowerSearch: This tool allows dealers to search CyberLots, CyberAuctions and physical auction pre-sale lists for a vehicle that meets their requirements. The dealer reviews the details and image of the car. If there is interest, the dealer clicks "Buy" and the Manheim Auction back office systems complete the transfer of the title, funds, and transportation of the vehicle to the dealer's lot. (See Exhibit 2.)

The Process of Moving Online

Reflecting on Manheim Online's experience of the last four years, Donald Foy identified the key challenges of moving online:

> *There were a couple of challenges. In the physical environment, the buyer (car dealer) gets the benefit of walking around the car and kicking the tires, opening the door and smelling the interior to see if it was smoked in. In an on-line environment, we have really had to go out of our way to describe the condition of a vehicle. Furthermore, we were driving the dealers along the technology curve with us. These are very smart people who run profitable businesses.*

Manheim Online overcame the challenge of dealers not being able to 'touch' the vehicle by leveraging the Manheim Auction physical assets. When a vehicle arrives at the physical auction site, a complete description of the vehicle is created that includes both the standard information such as model, color, mileage, vehicle options, year, and engine capacity. In addition, digital images are taken which show all aspects of the vehicle: exterior, interior, and any damage that has been done to the vehicle. Manheim Auctions will also complete a mechanical inspection of the vehicle if the consignor has requested this service. After mechanical inspection, Manheim Auctions assumes liability and provides a warranty for the 'road worthiness' of the vehicle. Steve Crawford, Director of Software Development describes how digital images of the vehicles are captured:

> *A detector triggers the video camera and an image of the car shows up on the Web site a couple of seconds later. It goes to a server that has all of these images on it. Those images are then used by the pre-sale list in Power Search or in the CyberLot listings.*

This complete description of the car is combined with an education process that alerts consignors to issues that can arise when a vehicle is sold unseen.

The strength of Manheim Auctions is its unrivalled access to the U.S. used automobile dealer network. Hal Logan explained:

> *Nearly every dealer in the United States comes into contact with a Manheim Auction on a weekly basis. We think we touch 85–90% of the entire U.S. dealer body on a weekly basis at the auctions.*

Manheim Auctions leveraged this access to the dealers to promote Manheim Online. Technology centers were established at the physical auction sites to both demonstrate Manheim Online services and to expose dealers to the power of the Internet. Technology managers run the technology centers. Donald Foy described their role:

> *Manheim Auctions started an initiative two years ago, appointing technology managers at every physical auction location. The technology manager is responsible for reaching out to dealers on sale days and between sales by visiting the dealerships and exposing them to our technology products. Not just Manheim Online, but other offerings we have like the Tracker system. That campaign has been very successful. That level of success at the physical auction has pushed a lot of eyeballs and dealer interest to Manheim Online.*

The general managers of the physical auction sites and their support of Manheim Online have been crucial to its success because they are the point of contact with the dealers. Hal Logan described how general managers and key personnel at the physical auction sites will share in future rewards from Manheim Online:

> *Should there come a day when Manheim Interactive is able to have a liquidity event, and issue some stock to the public, we'll make sure that the key people in the auction company have a piece of that. So from a personal wealth creation standpoint, our success becomes their success.*

IT Infrastructure and Architecture

From 1996 to 1999, the IT organization that developed, deployed and supported Manheim Online focused on speed of delivering and enhancing new services. As Manheim Online became more important to Manheim Auctions, a more structured approach was required. Steve Crawford described the ongoing changes:

> *This year Manheim Interactive was spun out as a separate company and we are taking this year to put a lot of the things in place that should have been there a long time ago. We are formalizing the development process, and adding a pretty big quality assurance staff within the project management group.*

To facilitate a more structured approach, IT management started initiatives in the areas of IT infrastructure, development processes and leveraging IT services from other companies within the Cox group.

IT Infrastructure: Manheim Interactive's internal infrastructure supports services such as e-mail, file sharing and security using Windows 2000 and back-office processing based on JD Edwards ERP. As much as possible, Manheim Interactive purchases infrastructure support services from Cox. Stephen Brown, Director of Technical Operations described the advantages to Manheim Interactive of leveraging services available within Cox.

> *For the IT piece, we've taken the approach of shopping different services throughout the parent company of Cox Enterprises to see where we can get best of breed services. So if we need e-mail server administration, we may go to the Cox Communications branch, and ask them to manage our e-mail servers. If we need internal network support, we may go to the Cox Communications Group, again, and ask them for those kinds of pieces. As far as desktop support, there are some very good groups inside of Cox. It's easier to partner with those groups that already have the management, the operations, that already have the infrastructure in place to actually provide those services to our employees.*

The external IT infrastructure is based on products from Sun Microsystems, Oracle, CISCO and F5 Lab's. Network services are provided by UUNET and the systems are hosted at Global Crossing. A key challenge is to use these products to build an IT architecture that scales to meet the continuously changing e-commerce needs of Manheim Interactive. The underlying architecture must be sufficiently flexible to robustly support applications that are continuously being enhanced to support changing business requirements.

Evaluation of IT architecture and infrastructure performance is based on four criteria: first, availability of every service and component[9] is continuously measured; second, performance of transactions in terms of cost and time is measured; third, service provided to internal customers is measured in terms of issues that need to be addressed and time taken to address those issues; finally, and most importantly, the balancing of investment and performance is monitored. Stephen Brown explained:

> *It would be easy to solve some of these problems by way over-engineering. Your performance would be excellent. But your use of capital assets would waste the corporation's money. So we actually look at a utilization factor by tracking what is the capacity we have applied to a particular product, where are we in the utilization of that particular capacity, and then how is that capacity changing over time so that we do just in time additions to the capacity.*

Development Processes: Originally, the development team focused on delivering new systems as quickly as possible. The team was responsible for all aspects of deploying a new Manheim Online service: the product management, the deploying of the web servers, development of the service and quality assurance of the service. Steve Crawford reflected on this situation:

> *The ability to always respond quickly eventually became a problem. We became very good at scrambling to meet demands very quickly but that has a cost and eventually we just said, okay, we're out of magic dust now. We need to rethink.*

Eventually this focus on speed of system delivery became unsustainable and system delivery

[9] A component may be a system, a helpdesk, a server in the hosting environment or a particular part of the application.

responsibilities are now shared between developers, product managers and quality assurance. The product management team is responsible for defining the product vision and managing the deployment of the product, thereby sheltering the development group so that they can focus on software development. The quality assurance group is responsible for testing new services. Steve Crawford described the re-organization process:

> *There have been a lot of growing pains along with that change. A lot of people like the small company kind of atmosphere that we had, because they get to wear lots of hats and do lots of things. It's a great place to learn a whole lot because it's very fast paced and there are very sharp business people here.*

Managing a New Online Business

The sharp logos, bright yellow office furniture and wall-mounted tropical fish tanks of Manheim Interactive's Atlanta offices are more reminiscent of a hip New York-based Internet design consultancy than a heavyweight of the used vehicle business. Hal Logan identified culture as a crucial aspect of making Manheim Interactive successful.

> *I spend a very large amount of my time thinking about cultural issues and working with cultural issues to make sure that we are the kind of place that really good programmers and product managers and sales and marketing people want to come to work. So, when we created a separate business, we moved out of the Manheim headquarters building. We spent a lot of energy making it a fun place to work. We have decorated it in a way that people seem to like. We have created what we call a comfort zone in the back with food and sodas. There are big screen TVs and video games. These are things that a 22-year-old programmer who is here at 3:30 in the morning really seems to appreciate. We are very relaxed about things like dress codes and when you show up in the morning, and when you go home in the afternoon. The idea is there is a job to be done. You're an adult. We expect you to get the job done in the time frame that we've given you. It's often not a relaxed time frame, but if indeed you leave at 3 o'clock one day because you've got a sick kid, or a frisbee game to get to, no problem, as long as the job gets done in the appropriate time frame. So we are trying to build a place that is respectful of the individuality of the people who work here, that at the same time focuses everybody on the key things we are trying to accomplish, and generates a sense of excitement, and not the least, a sense of fun about getting there. We try to be aggressive communicators, not only with our parent company across the street, but also with our employees here. So we tell them as often as we can what we think are the most important metrics within our business, and how we're doing on those metrics, so that everybody knows where we are at any moment in time. We want to make sure that as we choose those metrics, we are choosing them in such a way that everybody who works here can feel that he or she can make the contribution to at least one if not more.*

Metrics

To be successful, Manheim Interactive must complement and extend the franchise of Manheim Auctions. This mission requires continuous communication between the senior managements of Manheim Auctions and Manheim Interactive. Hal Logan described the process:

> *What we do is spend a very, very large amount of time making sure that we know what the auction company is doing that affects us, and that they know everything that we're doing. This morning I spent two hours, as I do every Friday morning, sitting with the top management of the auction company talking about issues.*

Manheim Auction is highly decentralized with considerable autonomy for the general managers of individual physical auction sites who need to be consulted on the development and strategy for Manheim Online. Hal Logan described these interactions:

> *We also spend a very large amount of time out in the field at those 86 auction locations talking to the general managers. Each of our auction general managers runs his own business at a very independent level. And so those individual auction managers need also to know what we're doing and how it impacts them and again, there is no substitute for*

getting on an airplane, going out there, and having that face to face conversation with them.

The growth of Manheim Interactive puts pressure on all parts of the business. To manage this growth senior management focuses on a few important metrics. Hal Logan explained his approach:

The few key metrics we use to monitor the success of Manheim Online are: the number of subscribers, the subscriber churn rate, the number and value of transactions taking place online, the percentage of the total subscriber base completing the online transactions and the number of consignors doing business electronically. Additionally, we track the growth of the subscriber base and the value of transactions completed online.

Vision for the Future

Hal Logan watched another car sell online and pondered the challenges facing Manheim Interactive over the next twelve months.

The primary reason dealers visit the physical auction space is to purchase vehicles; however, the physical auctions also have an atmosphere that generates excitement. A challenge for Manheim is to create a comparable thrill and adrenaline surge online.

We are going to be putting a lot of energy into talking to gaming companies about how we might take an activity that actually does have some excitement as an inherent part of it, and translate that excitement onto a computer screen in a way that will replicate some of that adrenaline surge in our online environment.

By 2003, the business plan calls for revenues in the $100s of millions and pre-tax income between $10 and $20 million. Extension of the franchise is planned by developing services that support dealers' trade vehicles not purchased at auction.

Seventy percent of the cars that are sitting on dealers' lots today as used cars do not come from auctions. They are sourced by purchases from other dealers, purchases from wholesalers and trade-ins. So we are building services that will enable dealers to more easily do those non-auction based, wholesale, used vehicle transactions on the Internet.

Manheim Interactive International has been established to create opportunities for non-auction based remarketing of used vehicles in Spain, Germany, France and Italy.

It turns out that for some reason you'll find physical auction infrastructure in a relatively small number of countries around the world, most of them English speaking. Outside of the English-speaking world, I think Japan is probably the only other country with a well-developed physical auction infrastructure. But there are used cars everywhere, and there is a need for the owners of those cars to get them remarketed and off to the next owner. And we have a number of our manufacturing and bank customers who are leasing cars overseas and are now confronting the need to remarket those cars in places where there aren't auctions. We can help them. So, we are building a new company, yet another new company, which will be called Manheim Interactive International. We will be building non-auction based, Internet selling solutions for our customers overseas.

Hal Logan realized that these challenges would only be met if the growth of Manheim Online registered dealers continues unabated and pondered how to make that happen.

EXHIBIT ONE
The CyberLot Directory

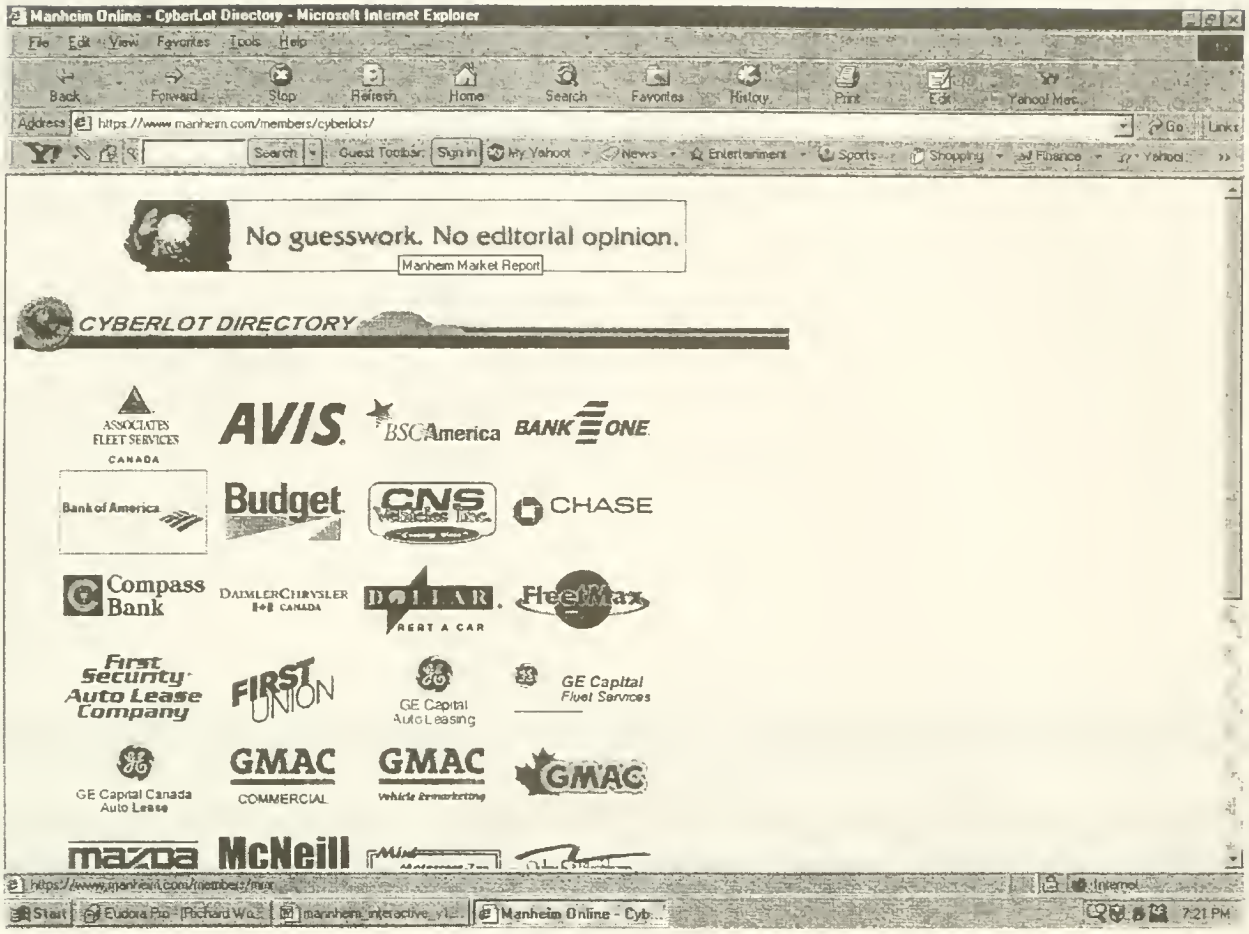
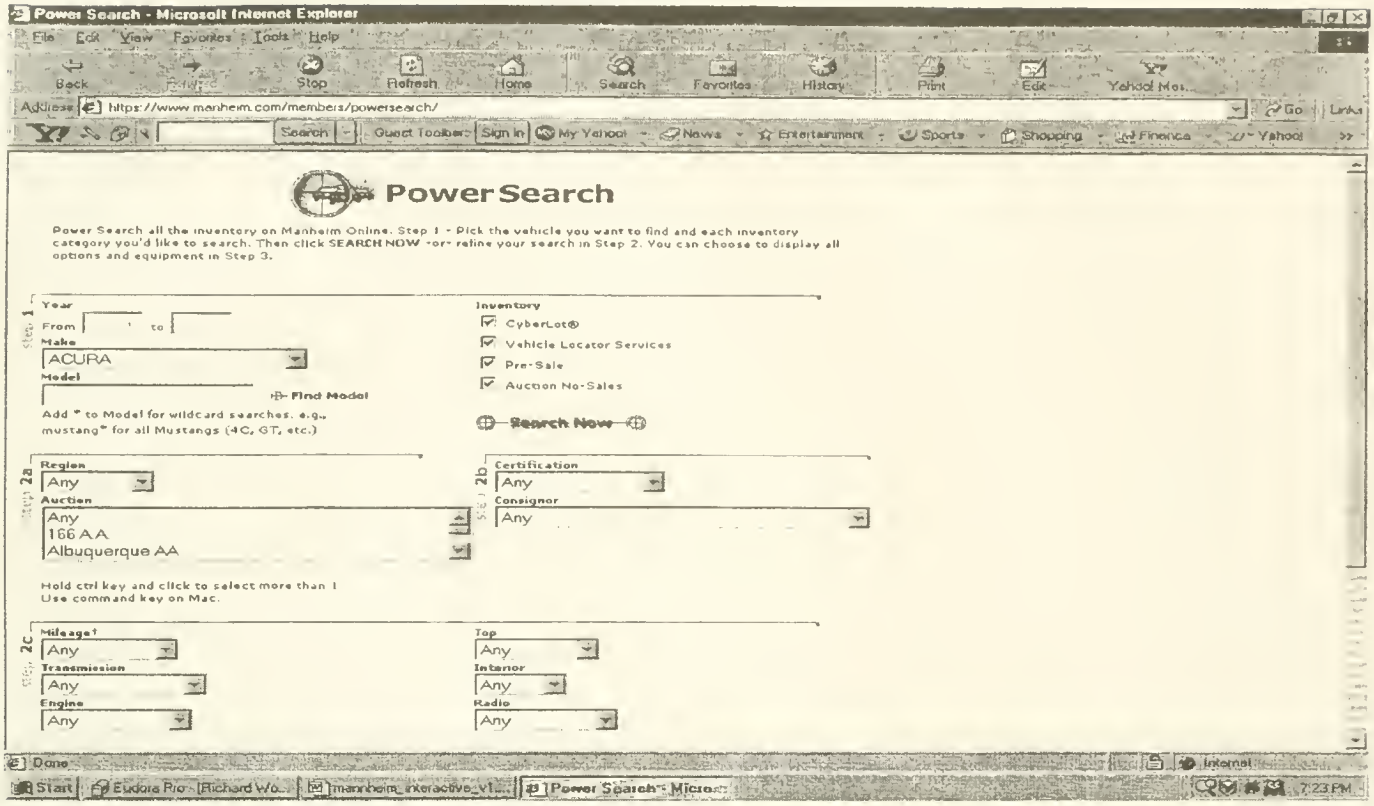
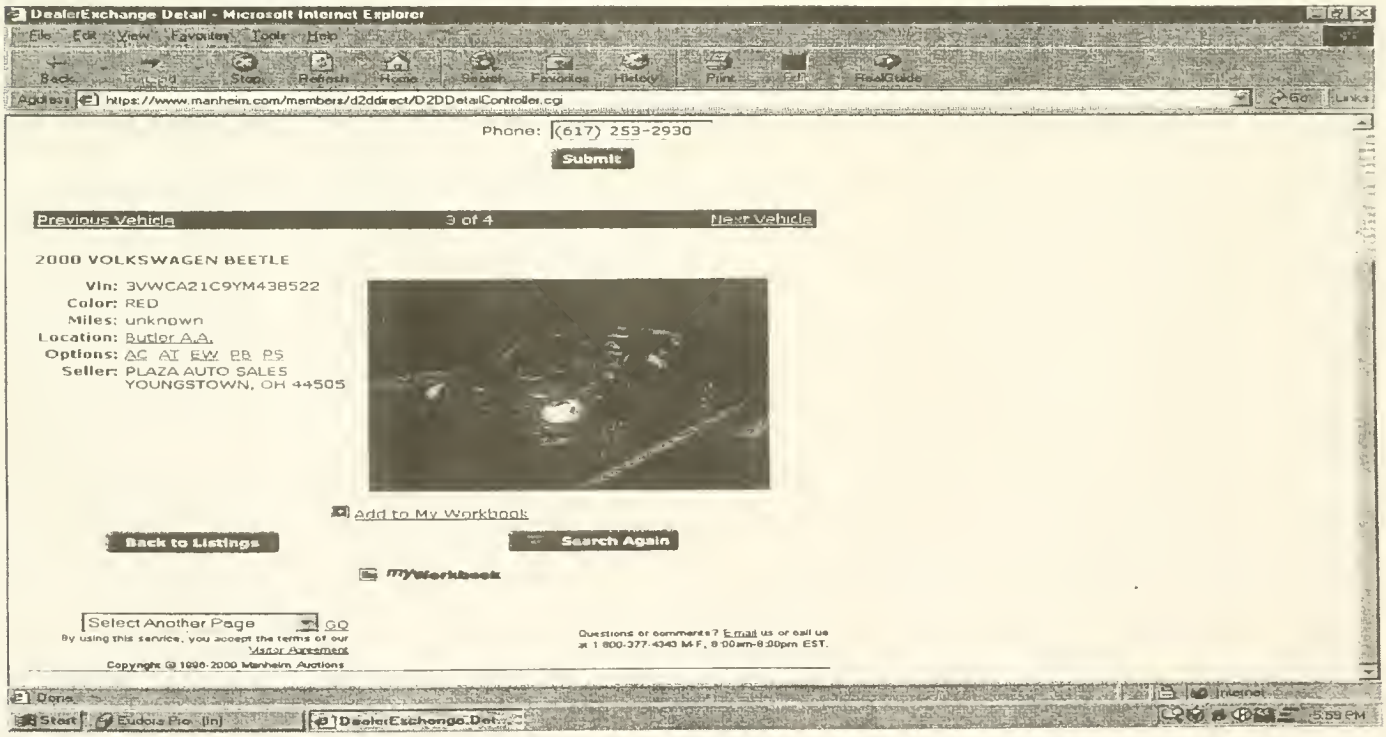


EXHIBIT TWO
Power Search Screen and Results





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